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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MICHAEL VERNON SPENCER

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Appeal 2010-004978  
Application 10/591,930  
Technology Center 1600

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Before RICHARD E. SCHAFER, MICHAEL P. TIERNEY, and RICHARD M. LEBOVITZ, *Administrative Patent Judges*.

LEBOVITZ, *Administrative Patent Judge*.

DECISION ON APPEAL<sup>1</sup>

This is a decision on the appeal under 35 U.S.C. § 134 by the Patent Applicant from the Patent Examiner's rejections of claims 1-5, 7, 8, and 17-

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<sup>1</sup> The two-month time period for filing an appeal or commencing a civil action, as recited in 37 C.F.R. § 1.304, or for filing a request for rehearing, as recited in 37 C.F.R. § 41.52, begins to run from the "MAIL DATE" (paper delivery mode) or the "NOTIFICATION DATE" (electronic delivery mode) shown on the PTOL-90A cover letter attached to this decision.

19 in U.S. Application 10/591,930. The Board's jurisdiction for this appeal is under 35 U.S.C. §§ 6(b). We affirm.

#### STATEMENT OF THE CASE

The claims are directed to a process comprising depolymerizing an ethylcellulose in the presence of a gaseous hydrogen halide to achieve a reduction in its viscosity, and then packaging the depolymerized product without an acid neutralization step. According to the Specification, ethylcelluloses are useful in a wide variety of industrial and pharmaceutical applications, including in printing inks, paper coatings, tablet binders, and for controlled release (Spec. 1:8-10).

Claims 1-5, 7, 8, and 17-19 are pending and stand rejected as follows:

1. Claims 1-5, 7, 8, and 17-19 under 35 U.S.C. § 103(a) as obvious in view of Schulz,<sup>2</sup> Keary,<sup>3</sup> Pyle,<sup>4</sup> and Savage<sup>5</sup> (Answer 4-5); and
2. Claims 1-5, 7, 8, and 17-19 on the ground of nonstatutory double-patenting as unpatentable over claims 1-6 of Rosenberg<sup>6</sup> in view of Schulz, Keary, Pyle, and Savage (*id.* at 11).

Claim 1 is representative and reads as follows:

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<sup>2</sup> Schulz, U.S. Patent 6,261,218 B1, issued July 17, 2001.

<sup>3</sup> Keary, U.S. Patent 6,294,008 B1, issued September 25, 2001.

<sup>4</sup> Pyle, U.S. Patent 2,711,965, issued June 28, 1955.

<sup>5</sup> Savage, U.S. Patent 3,728,331, issued April 17, 1973.

<sup>6</sup> Rosenberg, U.S. Patent 6,306,333 B1, issued October 23, 2001.

1. A process for producing an ethylcellulose having an ethoxyl content of from 40 to 55 percent and a viscosity of from 1 to 100 mPa's, measured as a 5 weight percent solution in toluene and ethanol at a volume ratio of 80 : 20 at 25° C, which process comprises the step of

    depolymerizing an ethylcellulose having an ethoxyl content of from 40 to 55 percent and a viscosity of from 4 to 400 mPa's in the presence of gaseous hydrogen halide to achieve a reduction in viscosity of the ethylcellulose of at least 10 percent and

    packaging the depolymerized ethylcellulose without a neutralization step after depolymerization.

#### OBVIOUSNESS

Claims 1-5, 7, 8, and 17-19 stand rejected under 35 U.S.C. § 103(a) as obvious in view of Schulz, Keary, Pyle, and Savage.

#### Issues

Would the ordinary skilled worker in the art have had a reason to modify the Schulz depolymerization process by omitting the neutralization step?

Would it have been obvious to have used Pyle's cellulose ether in the depolymerization process described by Schulz?

Did Appellant establish unexpected results for the claimed process as compared to the closest prior art?

#### Legal Principles

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 416-17 (2007).

In determining the scope and content of the prior art under section 103, “[a]ll the disclosures in a reference must be evaluated, including nonpreferred embodiments.” *In re Mills*, 470 F.2d 649, 651 (CCPA 1972).

“One way for a patent applicant to rebut a *prima facie* case of obviousness is to make a showing of ‘unexpected results,’ i.e., to show that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would have found surprising or unexpected.” *In re Soni*, 54 F.3d 746, 750 (Fed. Cir. 1995).

To establish unexpected results, the claimed subject matter must be compared with the closest prior art. *In re Baxter Travenol Labs.*, 952 F.2d 388, 392 (Fed. Cir. 1991).

Arguments of counsel cannot take the place of evidence lacking in the record. *Estee Lauder Inc. v. L'Oreal, S.A.*, 129 F.3d 588, 595 (Fed. Cir. 1997).

#### Findings of Fact (FF)

##### *Schulz*

1. Schulz describes a method for depolymerizing high molecular weight cellulose ether by treating it with a strong acid, such as gaseous hydrogen chloride (a hydrogen halide) (col. 4, ll. 38-41 & 51-66).
2. Schulz stated: “Following depolymerization, the particulate cellulose ether is contacted with a basic compound, preferably a substantially

anhydrous basic compound, to partially or substantially neutralize any remaining acid." (Col. 5, ll. 17-20.)

3. Claim 1 of Schulz is directed to a method of depolymerizing a cellulose ether with an acid, and does not recite an acid neutralization step (col. 7, ll. 20-27).

*Keary*

4. Keary has disclosure similar to FF1 & FF2 of Schulz, at col. 3, ll. 48-51 and col. 3, ll. 54-58, respectively.

*Pyle*

5. The Examiner relied upon Pyle as follows:

Pyle teach[es] that ethylcellulose compositions are known to be useful (column 1 lines 24-27). . . . In example 1, Pyle teach[es] a specific ethylcellulose composition that contained 46.5% ethoxyl groups and was dissolved in a solvent consisting of 80 parts toluene and 20 parts ethanol to give a 5% solution with a viscosity of 97 cps (i.e. 97 mPa·s) at 25 °C (column 2 lines 14-18). . . . Pyle recognize[s] that ethylcelluloses with preferably 43% to 48% ethoxyl content are particularly useful (column 4 lines 23-27).

(Answer 6.)

*Savage*

6. Savage describes reducing the viscosity of a cellulose ether with hydrogen peroxide (col. 1, ll. 55-58).

7. Savage discloses that after hydrogen peroxide treatment, residual amounts are present after storage (col. 3, ll. 50-53).

8. Savage teaches eliminating residual peroxides by heating to provide a stable viscosity grade product (col. 3, ll. 53-70).

### Analysis

There is no dispute that Schulz describes a process as recited in claim 1 in which an ethylcellulose is depolymerized in the presence of a gaseous hydrogen halide (FFs 1 & 2; Answer 4-5). The Examiner acknowledged that the Schulz did not describe the ethoxyl content or viscosity of the ethylcellulose recited in claim 1, but found that Pyle taught an ethylcellulose composition that met the claimed limitations (FF 5; Answer 6). The Examiner also found that Schulz did not disclose packaging the depolymerized ethylcellulose without neutralization, but determined it would have been obvious to omit this step in view of the teachings in Schulz and Savage.

#### Packaging without a neutralization step

Claim 1 recites that the depolymerized ethylcellulose is packaged “without a neutralization step.” Appellant acknowledge that Schulz and Keary disclose depolymerization with hydrogen chloride, as in claim 1, but contend that this process step is followed by “mandatory” acid neutralization (App. Br. 10). Appellant argues that Savage relates to peroxide treatment, and therefore there “can be no neutralization step” in its process (*id.*). Appellant concludes: “Since the Savage process has no teaching regarding neutralization, but neutralization is mandatory in the Schulz and Keary references, the skilled artisan would not be motivated to combine the references.” (*Id.*)

Persons of ordinary skill in the art would not have believed that acid neutralization is a necessary step in the Schulz and Keary depolymerization processes. All the disclosure of a reference must be evaluated, including

non-preferred embodiments, to determine the scope and content of the reference. *In re Mills*, 470 F.2d 649, 651 (CCPA 1972). As argued by the Examiner, Schulz and Keary describe partially neutralizing the acid, indicating that it is unnecessary to completely remove the acid from the packaged polymer and that neutralization is not a critical step of the process (Answer 21; FFs 2, 3, & 4). The Examiner buttressed this finding by pointing to claim 1 of the Schulz patent which is drawn to a depolymerization process which omits the acid neutralization step (FF 3). Moreover, Schulz discloses “partially or substantially neutralize *any* remaining acid.” (FF 2; emphasis added.) Thus, if there were no acid left after the depolymerization step (i.e., not any), partial or substantial neutralization would not be necessary. Taken together, the cited Schulz and Keary patents provide fact-based evidentiary support for the Examiner’s determination that neutralization is dispensable step.

The Examiner’s determination is consistent with Savage, which while it uses hydrogen peroxide as the depolymerization/viscosity reducing agent, recognized that its removal is only necessary to achieve a particular level of product stability (FFs 6-8).

#### Starting material

Appellant did not dispute that Pyle’s ethylcellulose met the recited ethylcellulose of claim 1, but rather argued that Pyle did not “teach a depolymerization process.” (App. Br. 7.)

This argument is not persuasive. Schulz’s depolymerization process was not restricted to a particular cellulose ether (FF 2). The Examiner provided evidence the claimed ethylcellulose was known in the prior art and

known to be useful (FF 5). Consequently, persons of ordinary skill in the art would have reasonably understood that any useful cellulose ether could be utilized in Schulz's process, including the known ethylcellulose ether described by Pyle.

#### Unexpected results

Based on the following statements in the Specification, Appellant contends the claims "reflect the surprising finding of the Applicants that the depolymerized ethylcellulose can be packaged without a neutralization step after depolymerization and the depolymerized ethylcellulose still has an unexpectedly high shelf life" and is "surprisingly stable, even if some or all of the utilized hydrogen chloride is still present." (App. Br. 10.)

By avoiding a neutralization step before the depolymerized ethylcellulose is packaged for transportation and usage, contamination with a basic compound can be avoided. Surprisingly it has been found that the depolymerized ethylcellulose has an unexpectedly high shelf life, even if some or all of the used hydrogen chloride is still present in the depolymerized ethylcellulose. Over 4 months under storage at 4 °C, a viscosity drop of less than 1.5% of the final viscosity is observed.

(Spec. 6: 20-25.) Appellant contends that the Examiner has not given sufficient weight to the these statements

The Specification stated that depolymerized ethylcellulose has "an unexpectedly high shelf life, even if some or all of the used hydrogen chloride is still present in the depolymerized ethylcellulose." (*Id.*) The Specification reported a drop of less 1.5% of viscosity, apparently when stored in the presence of hydrogen chloride. But the Specification did not describe the change in viscosity, if any, when hydrogen chloride was

substantially or partially absent as would be the case in the Schulz and Keary processes (FFs 2 & 4). Unexpected results must be compared with the closest prior art. *Iron Grip Barbell Co.*, 392 F.3d at 1322; *In re Baxter*, 952 F.2d at 392. The closest prior art is Schulz and Keary. As no comparative data was presented between the claimed process and that of Schulz or Keary, it has not been shown that the results are “unexpected” as compared to the closest prior art.

The inventors stated in the Specification that the shelf life was “unexpectedly high” if “some or all” of the hydrogen chloride were present. Schulz explicitly describes partial neutralization of the acid (FFs 2 & 4), covering a depolymerization process in which “some” of the hydrogen chloride remains. In contrast, the claims are drawn to a process “without a neutralization step.” Accordingly, the process in which some hydrogen chloride remains is taught by the prior art and not covered by claim 1. The “unexpected” results with respect to this embodiment are therefore not pertinent to the obviousness determination at issue in this appeal.

The Specification reported a 1.5% change in viscosity when the depolymerized product was stored in the presence of hydrogen chloride, but did not disclose the hydrogen chloride content of the stored product. The inventors stated in the Specification that an unexpectedly high shelf life was observed when “some or all” the hydrogen chloride was present. However, the inventors did not state whether the 1.5% reduction in viscosity was observed with *some* or *all* the hydrogen chloride present with the depolymerized ethylcellulose. Thus, the inventors did not completely describe the conditions under which the “expected” results were obtained.

The inventor's statements in the Specification that the depolymerization process produced unexpected results have been given weight. However, these statements must be weighed against the requirement that unexpected results be demonstrated with objective evidence. *See Estee Lauder Inc.*, 129 F.3d at 595. We agree with the Examiner's conclusion that the statements in the Specification are deficient for factual reasons: because of a failure to provide a comparison with the closest prior art, as well as to completely describe the conditions, with respect to hydrogen chloride content, under which the 1.5% drop in viscosity was observed.

#### OBVIOUSNESS-TYPE DOUBLE PATENTING

Claims 1-5, 7, 8, and 17-19 stand rejected on the ground of nonstatutory obviousness-type double-patenting as unpatentable over claims 1-6 of Rosenberg in view of Schulz, Keary, Pyle, and Savage (Answer 11).

Rosenberg's claim 1 is directed to a process comprising depolymerizing a cellulose ether with an acid and then "partially or substantially neutralizing the acid" with a basic compound. The cellulose is recited to have a viscosity of about 200 centipoise. The Examiner found claim 1 differed from Rosenberg's claim in depolymerizing a different cellulose ether, lacking a neutralization step, and not describing the acid as a hydrogen halide (Answer 11-13). The Examiner found these deficiencies met by the cited prior art for the same reasons as in the section 103 rejection.

Appellant contends that Rosenberg's claimed process is opposite to the claimed process because it involves "partially or substantially removing the acid," and not "without" neutralization as claim (App. Br. 12-13). However, for the reasons described above, Schulz and Keary would have

reasonably suggested to the ordinary skilled worker that the neutralization step is dispensable and not critical. Consequently, this rejection is affirmed for the reasons described above and in the Answer.

#### SUMMARY

The rejection of claims 1 and 8 under 35 U.S.C. § 103(a) as obvious in view of Schulz, Keary, Pyle, and Savage is affirmed because:

the ordinary skilled worker in the art would have had a reason to modify the Schulz depolymerization process by omitting the neutralization step;

it would have been obvious to have used Pyle's cellulose ether in the depolymerization process described by Schulz; and

Appellant did not establish unexpected results for the claimed process as compared to the closest prior art.

Claims 2-5, 7, and 17-19 fall with claims 1 and 8 because separate arguments for their patentability were not provided. 37 C.F.R. § 41.37(c)(1)(iv).

The nonstatutory obviousness-type double-patenting rejection of claims 1-5, 7, 8, and 17-19 as unpatentable over claims 1-6 of Rosenberg in view of Schulz, Keary, Pyle, and Savage is affirmed.

#### TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED

ack

cc:

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